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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,777	05/03/2005	Hiroshi Miyagi	A-495	7906

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EXAMINER	
CHOW, CHARLES CHIANG	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/533,777	MIYAGI ET AL.	
	Examiner	Art Unit	
	Charles Chow	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☒ Claim(s) *8-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

Title

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The current title, "Receiver of Double conversion", is not descriptive for the key features of the invention, for the antenna tuning with variable capacitance using digital-to-analog converter having the temperature coefficient setting section.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. (US 4,491,978) in view of Gaskill et al. (US 5,301,358).

For claim 1, Nagata et al. [Nagata] discloses a receiver of double conversion system [Fig. 5] comprising

an antenna tuning circuit [circuit for variable capacitor 102, col. 3, lines 2-11] including a tuning coil [coil of the loop antenna 101; applicant's tuning coil 11 is not variable];

a high frequency amplification circuit [transistor amplifier 106] for performing high frequency amplification for a signal outputted from said antenna tuning circuit [106 amplifies signal from the output of the matching capacitor 103, col. 3, lines 9-11];

first and second mixing circuits for performing frequency conversion twice for an output of said high frequency amplification circuit [double conversion via mixer 109 & mixer 112, col. 3, lines16-36]; and

a detecting circuit for performing detection processing for an output of said second mixing circuit [discriminator 116 & decoder 118 detected the output of the second mixer 112 via filter 114, amplifier 115, col. 3, lines 37-56].

Nagata fails to teach a variable capacitance diode.

Gaskill teaches the antenna tuning circuit including a variable capacitance diode [the varactors 24, 30 in Fig. 2 is for antenna tuning via signal Vcap from D/A converter 42 in controller 16, col. 4, lines 13-57], to automatically maximize the RSSI by tuning the antenna receiving frequency [col. 3, lines 3-20]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to upgrade Nagata with Gaskill's automatically tuning, in order to improve the RSSI by tuning the antenna receiving frequency.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata in view of Gaskill, as applied to claim 1 above, and further in view of Birleson et al. (US 7,079,195 B1).

For claim 2, Nagata teaches the receiver of double conversion system [Fig. 5].

Nagata, Gaskill fail to teach the features for this claim.

Birleson et al. [Birleson] teaches the wherein said first mixing circuit converts a frequency of a signal outputted from said high frequency amplification circuit to a frequency higher than a frequency of a broadcast wave, and wherein said second mixing circuit converts a frequency of a signal outputted from said first mixing circuit to a frequency lower than the frequency of the broadcast wave [the receiving broadcast frequency of 55-806 MHz in col. 10, lines 16-20; up converting to first IF, IF1, of 1083-1097 MHz, & second IF, IF2, of 45.75 MHz in col. 10,lines 41-62], to improve the image frequency rejection [col. 10, lines 54]. Therefore, It would have been obvious to one of ordinary skill in the art at the time

the invention was made to improve Nagata, Gaskill with Birleson's up conversion & down conversion, in order to reject the image frequency.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata in view of Gaskill, as applied to claim 1 above, and further in view of Dunn, Jr. et al. (US 6,867,745 B2).

For claim 3, Nagata teaches the receiver of double conversion system [Fig. 5]. Nagata, Gaskill fail to teach the features for this claim.

Dunn Jr. et al. [Dunn] teaches the wherein said tuning coil included in said antenna tuning circuit is a bar antenna in which a conducting wire is wound around a magnetic core [the ferrite bar loop antenna having the windings 12, 13 & varactor diode in Fig. 1, col. 1, lines 48-67], to reduce the interfering noise [col. 1, lines 3-6]. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve Nagata, Gaskill with Dunn's bar loop antenna with coil winding, in order to reduce the interference noise.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata in view of Gaskill, as applied to claim 1 above, and further in view of Van Voorhies (US 6,239,760 B1).

For claim 4, Nagata teaches the receiver of double conversion system [Fig. 5],

wherein said tuning coil included in said antenna tuning circuit is a loop antenna [the 10 is a loop antenna in the tuning circuit in Fig. 1].

Nagata, Gaskill fail to teach a conducting wire is wound in a loop shape.

Van Voorhies teaches these features [the windings in Fig. 61 is formed onto the toroidal core, col. 17, lines 26-47], for providing a wider frequency band width [col. 6, lines 28-34].

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to upgrade Nagata, Gaskill with Van Voorhies' toroidal antenna windings, in order to provide a wider frequency band width.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata in view of Gaskill, as applied to claim 1 above, and further in view of Yamamoto (US 6,795,128 B2).

For claim 5, Nagata teaches the receiver of double conversion system [Fig. 5].

Gaskill teaches a digital-analog converter for generating a control voltage for setting a tuning frequency applied to said variable-capacitance diode included in said antenna tuning circuit; and for inputting the data to said digital-analog converter [the tuning voltage Vcap from D/A 42 in 16 to antenna tuning 14 [col. 4, lines 13-57].

Nagata, Gaskill fail to teach the further features in below for this claim.

Yamamoto teaches the further comprising a local oscillator [9] for inputting a local oscillation signal whose frequency is variable [varied by PLL 10, col. 5, lines 54-61] to said first mixing circuit [5] to which an output signal of said high frequency amplification circuit is inputted [output of rf amplifier 3];

and a control section [PLL10] for setting the frequency of the local oscillation signal outputted from said local oscillator [col. 5, lines 21-37 & col. 5, lines 47-58, for the television signal or FM signal] and for generating a frequency setting data required for associating the tuning frequency of said antenna tuning circuit with the frequency of the local oscillation signal and the antenna tuning voltage [the relation is changed between the voltage applied to the varactor 32 of antenna tuning and the frequency of local oscillator, col. 5, line 58 to col. 6, line 7], to corporate the antenna frequency tuning with the local oscillator frequency tuning, for different rf signal. Therefore, It would have been obvious to one of ordinary skill in

the art at the time the invention was made to upgrade Nagata, Gaskill with Yamamoto's antenna tuning, in order to corporate the antenna frequency tuning with the local oscillator frequency tuning, for different rf signal.

7. Claim 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata in view of Gaskill, Yamamoto as applied to claim 5 above, and further in view of Osburn et al. (US 5,428,829).

For claim 6, Nagata teaches the receiver of double conversion system [Fig. 5]. Nagata, Gaskill fail to teach the features for this claim.

wherein said digital-analog converter changes the control voltage with a predetermined temperature coefficient in accordance with ambient temperature [the ambient temperature compensation via Vd for the compensated digital-to-analog D/A converter 136 output voltage 82 for the antenna tuning in Fig. 3b, Fig. 1, equation (1) & col. 7, lines 27-36 & col. 8, lines & col. 8, lines 11-50], in order to improve the signal reception by avoiding the antenna frequency shift due to ambient temperature change. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to upgrade Nagata, Gaskill, Yamamoto with Osburn's temperature compensated D/A convert output voltage for the antenna tuning, in order to improve the signal reception by avoiding antenna frequency shift due to ambient temperature change.

For claim 7, Nagata teaches the receiver of double conversion system [Fig. 5]. Nagata, Gaskill fail to teach the features for this claim.

Osburn teaches the wherein said digital-analog converter [D/A 136] comprises a temperature coefficient setting section [prgrammable gain β] constituted by including

elements having predetermined temperature coefficients [the gain 2β is within 0.000 to 1.992, col. 7, lines 10-36] , and

wherein a device constant of said temperature coefficient setting section as a whole is changed in accordance with ambient temperature [the setting of D/A device constant β, such that, as a whole, the Vd of the diode 130 cancels the voltage offset error due to ambient temperatures change, based on V82 is a function of β, Vd in equation (5) in col. 7; C80 is constant over temperature in col. 8, lines 11-31], using the same reasoning in claim 6 above to combine Osburn to Nagata, Gaskill & Yamamoto.

Claims Objection

8. Claim 8-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior arts, in above & in conclusion, fail to teach the features in claims 8-10, for the digital-analog converter, said high frequency amplifier circuit, said first and second mixing circuits, said detecting circuit and said local oscillator are formed on a same semiconductor, wherein said temperature coefficient setting section includes a plurality of resistance formed by semiconductor manufacturing process and which have temperature coefficients different from each other, and connection from of said plurality of resistances is set so that a temperature coefficient of said digital-analog converter reaches a predetermined value in claim 8; Claims 9-10 are objected also, due to their dependency upon objected clam 8.

For claim 11, the prior arts fail to teaches the features in this claim, by providing the proper reason to combine Iizuka (US 5,585,751, D/A 8, Fig. 3, col. 5, lines 39-56) with Nagata, Gaskill, Yamamoto & Osburn.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. US 4,862,516, Macnak et al. teaches antenna tuning [Fig. 1-6, abstract] with D/A converter 34.

B. US 6,081,700, Salvi et al. teaches the self tuning antenna via signal from controller 122 [Fig. 1, abstract] having varactor diode 104.

C. US 5,745,844, Kromer et al. teaches the antenna tuning circuit 140 receiving tuning signal from controller 130 [Fig. 1-3, abstract].

D. US 2006/0145,918, Henderson et al. teaches the steering of the antenna pattern [abstract, Fig. 1/Fig. 4, having DAC 416 for sending tuning voltage to the varactors in 418.

E. US 2004/0116,091 A1, McGinn, having later filing date, teaches the antenna tuning using DAC 175 [Fig. 1, Fig. 4, abstract], having temperature compensation in the DAC, change & temp signals [Fig. 4, paragraph 0038].

F. US 2002/0065,539 A1, Von Arx et al. teaches the controller 302 to tuning antenna via varactor 341 & D/A 342 [paragraph 0018].

G. US 4,326,296, Rafter et al. teaches the temperature compensation via circuitry 16 in Fig. 3 for the tuner 12 [abstract, Fig. 1].

H. US 2002/0107,054A1, Fujisawa et al. teaches the varactor diodes 31 for antenna LC in circuit 12 [Fig. 5].

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on

(571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow CC.

October 2, 2006.

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